



Fig. 1

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 A CHAMBER FOR THE CALIBRATION
 OF KEW PATTERN BAROMETERS

The need for a calibration chamber for the standardisation of Kew barometers over the whole scale and not merely at atmospheric pressures, was felt when the construction of K.P. barometers was first taken up at Poona in 1950. In fixed cistern barometers, the index correction varies over the scale, if the contraction of the scale is not correctly related to the dimensions of the tube and cistern. It is, therefore, necessary to test these barometers over a range of pressure, and adjust the size of the cistern to suit the scale or replace the tube by one of the correct internal diameter. The equipment set up at Poona in the Instruments Section of the India Meteorological Department for the calibration of Kew pattern barometers is illustrated in Fig. 1. It consists of a thick-walled, heavy cast iron chamber about 4' x 21" x 7" with two glass windows A, on either side of chamber and an opening at the top, which can be closed by means of a heavy airtight lid B. The chamber was originally obtained many

years ago from R. W. Munro, London for the calibration of Fortin barometers. It has now been modified for the calibration of fixed cistern barometers as described below.

The chamber accommodates three barometers at a time, one standard or reference barometer and two to be calibrated. The barometers are suspended in the chamber by hooks from metal cross bars resting on the top of the chamber. The hooks can be screwed up or down enabling the position of the barometers to be adjusted to the correct height. The cross bars and therefore the barometers can also be shifted laterally for further adjustment, if required.

The windows, 17" by 13", are large enough to enable the whole graduated scale to be seen and read from outside. The scale is read

by means of a telemicroscope, held against the glass window. The vernier is moved up and down by means of three remote control knobs P, Q and R from outside. The control rods are inserted in the wall of the chamber by means of vacuum stopcocks and are connected by universal couplings J to sockets which are clamped to the vernier knobs on the barometers. The vernier scales are thus operated by turning the knurled heads of the stopcocks outside.

The temperature of the chamber is obtained from thermometers fixed inside the chamber and read through the windows. The thermometers are lagged by keeping the bulbs dipping in mercury contained in glass and metal tubes of the same diameters as the barometer tubes. The thermometer can be read correct to 0.1°C .

Pressure inside the chamber is varied by means of the three way metal stopcocks K_1 and K_2 which connect the chamber to either the pressure or vacuum reservoirs shown in Fig. 1. The reservoirs are connected in turn to pressure and vacuum pumps. Pressure can be varied within any required range, normally from 700 to 1000 mb and remains steady to 0.1 mb while the barometers are read.

The barometers to be standardised, two at a time are suspended inside the chamber on either side of the reference barometer and the heights adjusted correctly. The vernier knobs are connected to the sockets of the remote control unit, the lid placed in position and the bolts tightened. The normal procedure is to read the barometers from the left to the right and then back. This is repeated at higher and lower pressures throughout the range for every 50 mb. The corrections are then determined with reference to the standard to an accuracy of ± 0.1 mb.

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